

What is claimed is:

1. A method for evaluation of selection conditions corresponding to variants of components in a configurable product, comprising:
 - 5 receiving a plurality of selection conditions defining permissible combinations of values of characteristics of the product;
 - forming a bit matrix containing information representing combinations of the values of the characteristics;
 - forming bit strings by applying the selection conditions to the bit matrix, the bit
 - 10 strings representing the permissible combinations;
 - performing logical operations on the bit strings to determine whether the selection conditions permit at least one and at most one of a variant of a component to be included in the configurable product; and
 - outputting a result to a user.
- 15 2. The method of claim 1, further comprising receiving a restriction on combinations of values of the characteristics, and forming a corresponding bit string.
3. The method of claim 2, further comprising forming a bit string containing information
- 20 representing combinations of values of the characteristics that are neither covered by the selection conditions nor subject to a restriction.
4. A method for evaluating selection conditions associated with variants of components of a multi-component configurable product, comprising:
 - 25 (a) forming a bit matrix corresponding to combinations of values of characteristics of the product;
 - (b) applying the selection conditions to the bit matrix, the selection conditions defining allowed combinations of values of the characteristics, to determine whether the selection conditions provide for selecting at most one and at least one of variants
 - 30 corresponding to a component; and
 - (c) outputting a result to a user.

5. The method of claim 4, wherein information in the bit matrix represents all possible combinations of values for the characteristics that are subject to the selection conditions.
- 5 6. The method of claim 4, wherein the selection conditions are expressed as logical operations on the combinations of values.
7. The method of claim 4, wherein (b) comprises forming a first bit string corresponding to a first selection condition, the first bit string containing logic values representing combinations of values of the characteristics allowed by the first selection condition.
- 10 8. The method of claim 7, wherein (b) further comprises forming a bit string containing logic values representing forbidden combinations of the values of the characteristics.
- 15 9. The method of claim 7, wherein (b) further comprises:
forming a second bit string corresponding to a second selection condition, the second bit string containing logic values representing combinations of values of the characteristics allowed by the second selection condition; and
performing a logic operation on the first and second bit strings to determine
20 whether the first and second selection conditions allow a same combination of values of the characteristics.
10. The method of claim 9, wherein the logic operation ANDs the first and second bit strings.
- 25 11. A system for evaluation of selection conditions corresponding to variants of components in a configurable product, comprising:
a memory containing computer-executable instructions; and
a processor coupled to the memory to execute the instructions, the instructions
30 when executed performing a process comprising:

receiving a plurality of selection conditions defining permissible combinations of values of characteristics of the product;

forming a bit matrix containing information representing combinations of the values of the characteristics;

5 forming bit strings by applying the selection conditions to the bit matrix, the bit strings representing the permissible combinations; and

performing logical operations on the bit strings to determine whether the selection conditions permit at least one and at most one of a variant of a component to be included in the configurable product.

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12. The system of claim 11, wherein the selection conditions are expressed as logical operations on values assigned to the characteristics.

13. The system of claim 11, the process further comprising receiving a restriction on combinations of values of the characteristics, and forming a corresponding bit string.

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14. The system of claim 11, the process further comprising forming a bit string containing information representing combinations of characteristics that are neither covered by the selection conditions nor subject to a restriction.

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15. The system of claim 8, further comprising a graphical user interface configured to enable a user to invoke an execution of the process via an input device, and receive a result of the execution of the process.

25 16. A machine-readable medium storing computer-executable instructions, the instructions when executed performing a process for evaluation of selection conditions corresponding to variants of components in a configurable product, the process comprising:

receiving a plurality of selection conditions defining permissible combinations of values of characteristics of the product;

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forming a bit matrix containing information representing combinations of the values of the characteristics;

forming bit strings by applying the selection conditions to the bit matrix, the bit strings representing the permissible combinations; and

5 performing logical operations on the bit strings to determine whether the selection conditions permit at least one and at most one of a variant of a component to be included in the configurable product.

17. The machine-readable medium of claim 16, the process further comprising receiving
10 a restriction on combinations of values of the characteristics, and forming a corresponding bit string.

18. The machine-readable medium of claim 17, further comprising forming a bit string containing information representing combinations of values of the characteristics that are
15 neither covered by the selection conditions nor subject to a restriction.

19. A machine-readable medium storing computer-executable instructions for performing a method for evaluating selection conditions associated with variants of components of a multi-component configurable product, the method comprising:

20 (a) forming a bit matrix corresponding to combinations of values of characteristics of the product;

(b) applying the selection conditions to the bit matrix, the selection conditions defining allowed combinations of values of the characteristics, to determine whether the selection conditions provide for selecting at most one and at least one of variants
25 corresponding to a component.

20. The machine-readable medium of claim 19, wherein (b) comprises:

forming a first bit string corresponding to a first selection condition, the first bit string containing logic values representing combinations of values of the characteristics
30 allowed by the first selection condition;

forming a second bit string corresponding to a second selection condition, the second bit string containing logic values representing combinations of values of the characteristics allowed by the second selection condition; and

- 5 ANDing the first and second bit strings to determine whether the first and second selection conditions allow a same combination of values of the characteristics.